Report of the Radiance/Forward Model SubGroup

Tony Clough

Monday, September 11, Afternoon (1:15 p.m. –2:55 p.m.)
Room CG1-2

Radiance/Forward Model Validation Subgroup Session

Session chair: Tony Clough (clough@aer.com)

	1:15- 1:20 Introduction	
	1:20- 1:35 Validation of TES Radiances and Forward Model	Tony Clough
	1:35Š 1:50 Comparison of HIRDLS L1 and L2 data for Temperature O3 and H2O with ECMWF Analyses and Derived Radiance Data	Jolyon Reburn
	1:50- 2:05 The Aura Validation Experiment: S-HIS Radiance Calibration Validation and Retrieval Products	Hank Revercomb
	2:05 Š 2:20 Validation of TES Profiles using Radiance Closure Analysis	Mark Shephard
xxx	2:20 Š 2:35 Validation of the OMI Surface UV (OMUVB) product	Aapo Tanskanen
	2:35 Š 2:55 Discussion: Planned pape rs for Aura validation special issue? Future validation needs? Other topics?	


QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

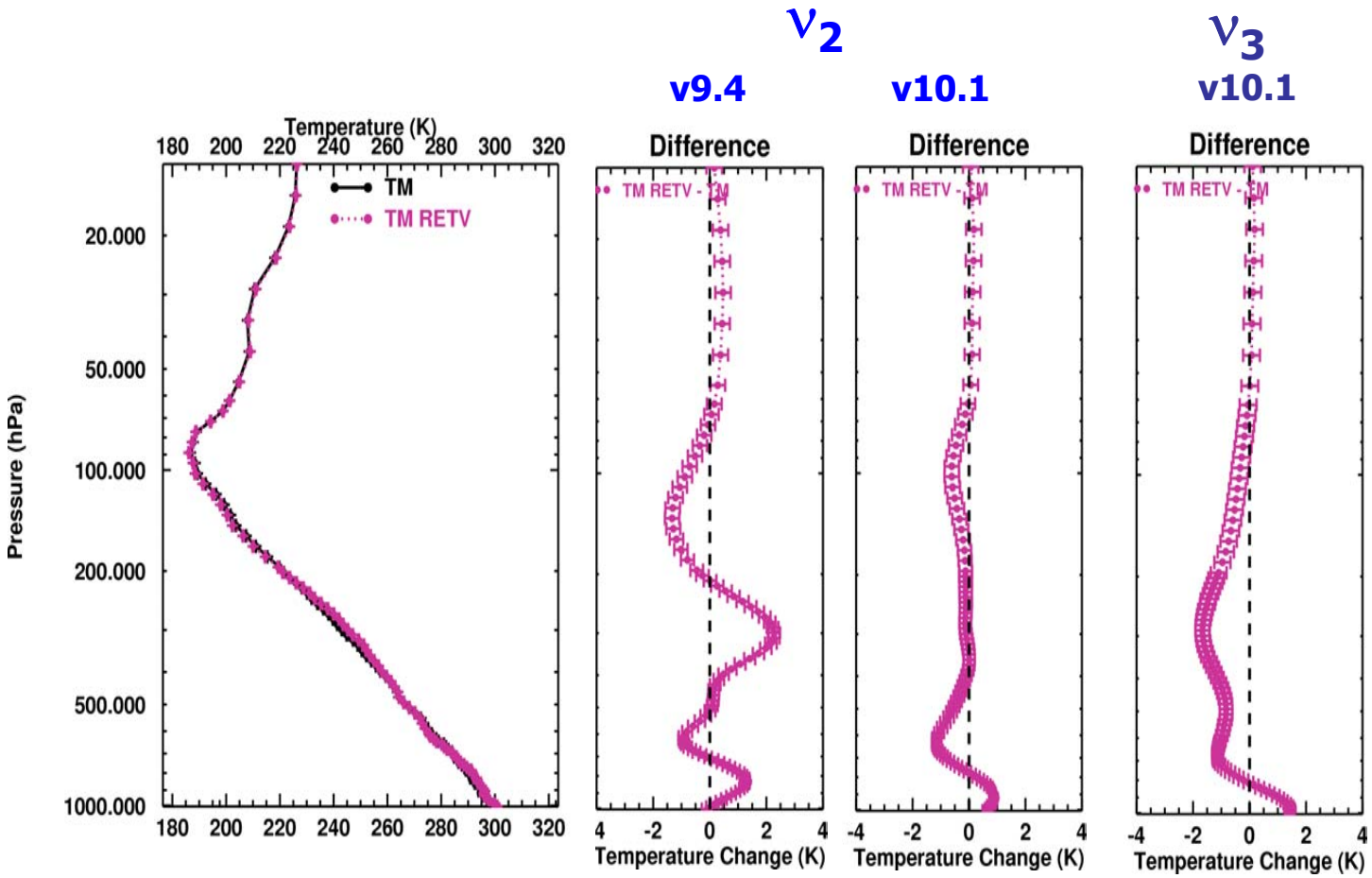
xxx

- TES interests were extensively represented
- As it turned out, no talks from OMI or MLS
- Inclusion of Forward Model validations with Radiance validations would likely expand interest, e.g. MLS

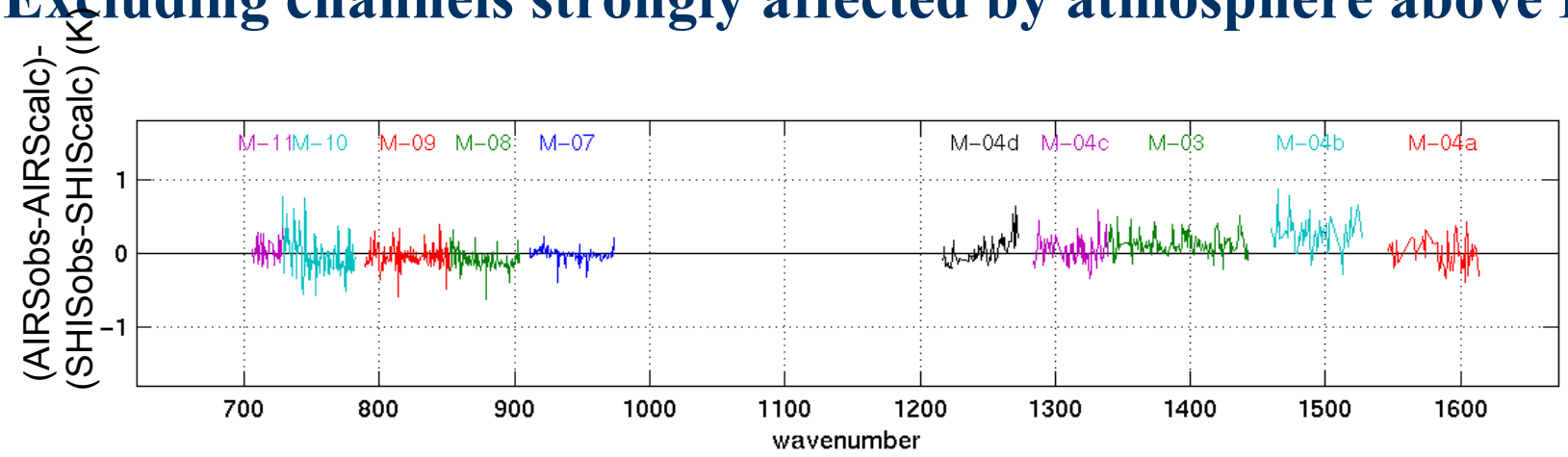
Summary

- Forward Model for TES has been improved for temperature retrievals
    - Validation with S-HIS, TES and AIRS
- HIRDLS: Very encouraging results
    - Comparison of HIRDLS radiances with simulation as a function of TH
        - ECMWF fields and HIRDLS FM
- Comparisons of S-HIS, AIRS, TES Radiances
    - Identified good validation case from CRAVE
- Validation of Temperature, Water Vapor and Ozone
    - Emphasis on spectral Residuals

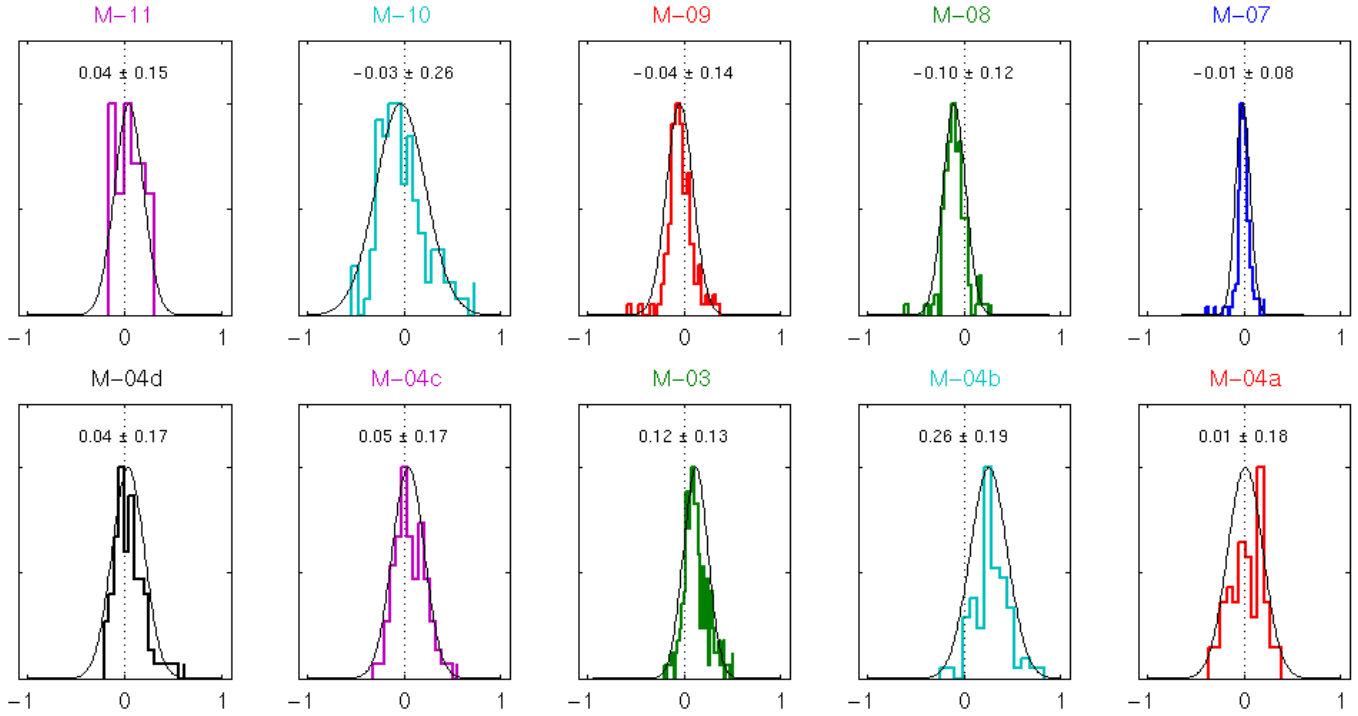
CO2 Temperature Retrievals



AIRS / SHIS Brightness Temperature Comparison
Excluding channels strongly affected by atmosphere above ER2



Histograms



What is 'Truth'?

- Spectral Residuals are Key!

- Consistency within a band system
  - Focus of this presentation

- Consistency between bands
  - AIRS ν_2 and ν_3 bands to investigate consistency for CO_2

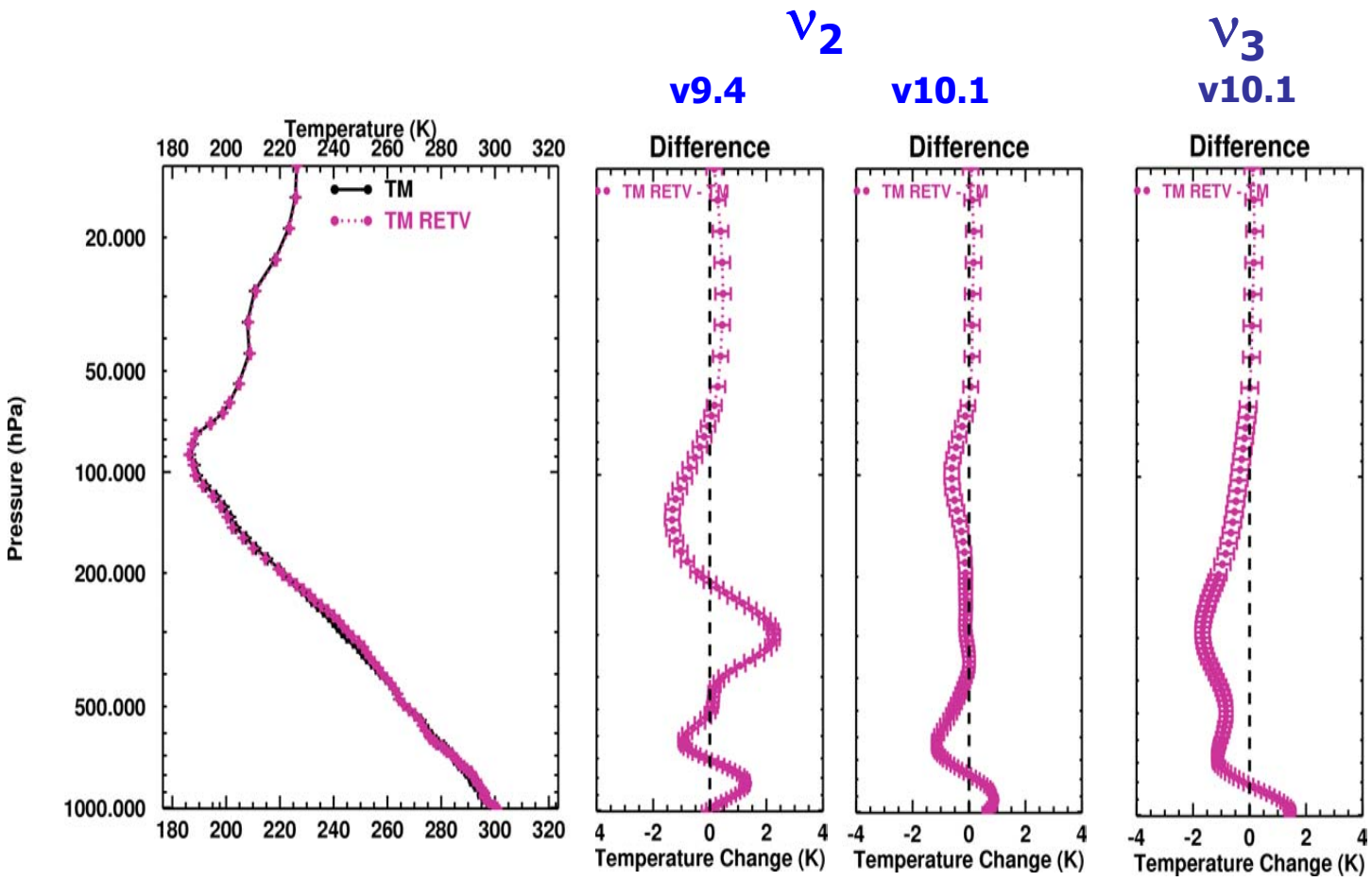
- Consistency between species
  - TES: temperature from O_3 and H_2O consistent with CO_2 ; N_2O

- Consistency between instruments
  - SHIS
  - AIRS
  - TES
  - AERI
  - ACE
  - MIPAS

Discussion

- S-His validations have been critical
  - remarkably few coincidences with clear sky
  - should be continued for focused objectives (arctic)
- Joining with other A-Train teams would be beneficial
  - help reach critical mass
- Increased emphasis on Forward Model validations
  - Forward Model Intercomparisons

CO2 Temperature Retrievals



Summary

- Forward Model for Temperature Retrievals significantly improved
  - improvements discussed here: CO_2 ; ν_2; 600 - 800 cm^{-1}
  - P-R line coupling is a key element
  - duration of collision effect and continuum: under study
  - current effort: CO_2 ; ν_3; 2200 - 2400 cm^{-1}
  - 'task force': Strow, Tobin, Shephard, Revercomb and Clough
- Focus of our group is shifting to the validation of
  Water Vapor, Ozone and Clouds
- Issues with water vapor continuum have become remarkably muted
- Updated Code and Line Parameters: to be made public
- Spectral Residuals should play a stronger role in the validation process